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March 26, 2014

Memorandum

To: Dayne Barron, District Manager
Medford District Bureau of Land Management
Medford, Oregon

From: Jim Thrailkill, Field Supervisor
Roseburg Fish and Wildlife Office
Roseburg, Oregon

Subject: Informal consultation on the Brimstone/Stratton Fire Salvage, Hazard Tree Removal and Pump Chance Maintenance Projects (Reference Number 01EOFW00-2014-I-0105).

This document transmits the Fish and Wildlife Service's (Service) Letter of Concurrence (LOC) addressing the Brimstone/Stratton Fire Salvage, associated Hazard Tree Removal and Pump Chance maintenance Projects (Proposed Action or Projects), as proposed by the Medford District Bureau of Land Management (District or BLM). At issue are the effects of these proposed actions on the threatened northern spotted owl (*Strix occidentalis caurina*) (spotted owl) and spotted owl critical habitat. This LOC was prepared in accordance with the requirements of section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.).

The enclosed LOC is based on information provided in the District's Biological Assessment (USDI BLM 2014; Assessment) dated February 18, 2014, and received in our office on February 20, 2014; as well as other supporting information cited herein. A complete decision record for this consultation is on file at the Service's Roseburg Field Office.

Please note that the analysis and findings presented herein regarding the effects of the Projects on the spotted owl do not rely on the Spotted Owl Estimation Methodology (OEM) (USDI/USDA 2008) pursuant to the court order issued by the District Court for the District *Swanson v Salazar* case on June 26, 2013.

The analysis and findings presented herein regarding the effects of the Projects on the spotted owl rely on the best available science as discussed in the *Spotted Owl Resource Use*, section

below. Additionally, Appendix 1provides a synopsis of literature we used to evaluate the effect of wildfire on spotted owls and spotted owl habitat, along with the Service's professional judgment on the project's potential effects to spotted owls.

CONSULTATION HISTORY

All Projects included in this proposed action represent newly planned projects the District designed consistent with the Medford District's 1995 Resource Management Plan (USDI BLM 1995) and the Northwest Forest Plan (USDA FS/ USDI BLM 1994). The Brimstone/Stratton fire salvage and associated hazard tree removal were initially presented to the Rogue Basin Level 1Team (Team) on October 30, 2013 and then at subsequent meetings on December 5 and 16, 2013, along with field trips on November 6, 2013 and January 15, 2014. This Team includes the Rogue River-Siskiyou National Forest Biologist, the Medford District BLM Biologist and the Service's Level 1 representative from the Roseburg Field Office. All Level 1 Team members reviewed and provided substantive comments on the Assessment and the proposed action. All projects described herein will be completed consistent with the project descriptions and PDCs described in the Assessment and this LOC. If changes to the proposed action occur, these changes and/or any new proposals will be presented to the Team for evaluation to determine if re-initiation of consultation is necessary.

DESCRIPTION OF THE PROJECT LOCATION AND PROPOSED ACTION

The District is proposing salvage of burned trees and maintenance of emergency water source (pump chance) projects on Matrix lands whereas the roadside hazard tree removal may occur within Matrix or Late Successional Reserve (LSR) land use allocations (LUA) (Table 1), as established under the Northwest Forest Plan (NWFP) (USDA FS/USDI BLM 1994). All Projects are planned within the District's Grants Pass Resource Area, Josephine County, Oregon and the Oregon Klamath Mountains Physiographic Province. Portions of the Stratton fire salvage and Pump Chance maintenance Projects occur within spotted owl critical habitat, the Klamath West Unit (Unit 9), sub-unit KLW-1 (USDI FWS 2012).

Table 1. Summary of the Medford District BLM's Brimstone/Stratton Fire Salvage, Hazard Tree Removal and Pump Chance Projects on the Grants Pass Resource Area and within the Oregon Klamath Physiographic Province (FWS Ref # 01EOFW00-2014-I-0105).

Project	Fire	Total Spotted Owl Habitat[1] Acres[2]	LUA	Treatment Type	Extent of road building (miles)[3]
Brimstone/ Stratton Fire Salvage	Brimstone/Stratton	177	Matrix	Timber Harvest	0.5
Imminent Roadside Hazard Trees[4]	Brimstone/Stratton	6	Matrix	Timber Harvest	0
		2	LSR		
Pump Chance maintenance	Adjacent to Dads Creek and Farmer's fires (Douglas Complex)	2	Matrix	Fuels	0

[1]Acres from May 2013 Medford District BLM GIS project layer (Assessment); acres are rounded to the nearest integer and slivers less than 0.5 acres are deleted.
[2]Acres (treated) of spotted owl nesting, roosting, and foraging (NRF) and dispersal-only habitat within the action area for each project.
[3] These are temporary roads that will be decommissioned after the project is completed and these acres are accounted for and analyzed in the Effects section.
4 Estimate of acres based on an approximation of hazard trees per road mile multiplied by 0.125 acres. Individual trees have not been identified yet and these trees will be selected on criteria as described in the Assessment.

Project Description

The Assessment (and Appendix 2 herein) includes a detailed description of the activities associated with the proposed action and is herein incorporated by reference. The following represents a project summary.

Brimstone and Stratton Fire Salvage Projects

The Brimstone fire began July 26, 2013, burning 2,298 acres, of which 1,413 acres (62 percent) are managed by the District. This fire burned in a mixed severity pattern, with most conifer mortality occurring on the upper elevation ridges, and the lower elevation drainages experiencing lower burn severity. The District estimates approximately 24 percent of the 1,413 acres burned with high severity, resulting in near total mortality of trees in these areas. Other areas experienced low to moderate severity fire, resulting in more of a patchwork of green trees intermingled with single or group tree mortality. The District proposes to salvage 165 (12 percent) of the 1,413 acres burned at high severity.

The Stratton Fire began, July 5, 2013, burning 154 acres, of which 107 acres (69 percent) are managed by the District. Similar to the Brimstone fire conditions, some areas of the Stratton fire

burned with high severity, resulting in near complete mortality of affected vegetation, while other areas experienced low to moderate burn severity. The District proposes to salvage 12 (11 percent) of the 107 acres of District-managed lands within this fire perimeter. These 12 acres burned at high severity.

District staff utilized Burned Area Reflectance Classification (BARC) data to determine preliminary Soil Burn Severity. BARC data rates fire impacts on soil productivity and erosion rate, and the potential for vegetation recovery. Burn severity is delineated on maps as polygons in four classes of burn severity High, Moderate, Low and Unburned to Very Low. While the BARC data is not an exact match for vegetation mortality, high and moderate burn severity categories can be used estimate the amount of vegetation mortality as a result of the fire (Assessment).

The District plans to salvage trees they considered as dead, dying, or high risk (tree health condition indicates that the tree death will probably occur within 4 years), utilizing crown scorch as a measure of the proportion of foliage that has been killed by the fire relative to the entire amount of foliage present before the burn (SWOFIDSC 2001). Shaw et al. (2009) identify trees with more than 50 percent crown scorch as having high risk of insect attack that should be removed to avoid subsequent post-fire insect related damage. Using crown scorch of ≥70 percent, excluding cambium inspections, is a conservative measure for determining post-fire mortality in trees, primarily Douglas-fir, with a high probability of dying within the next 2-5 years (SWOFIDSC 2001, Fowler and Seig 2004, Filip et al. 2007). Overstory fire-killed trees (as defined above) would be retained at a minimum of two snags per acre 20″ diameter at breast height (DBH) or greater within salvage units in the Matrix LUA. The District plans to retain higher retention levels of snags and coarse wood within spotted owl core-use areas as well as within critical habitat (see details below).

The District's purpose of removing the dead and dying trees will allow a more rapid stand initiation than if left to naturally regenerate (Assessment). The District plans to replant salvaged areas with tree species suited to the natural plant communities of the individual sites, including drought resistant tree species. Post-harvest legacy structures consisting of suitable live green trees, standing dead, and coarse woody material would be retained as dispersed and/or aggregated residuals. This within and between stand patterns of legacy structures likely will provide a mosaic of habitat beneficial to native bird and mammal species in the short-term (as opposed to large scale salvage of the area). In the longer-term as forest succession occurs, these legacy structures likely will provide multilayered characteristics of spotted owl and prey habitat.

While the intent of salvage is to remove dead and dying trees, incidental live trees may be felled and removed through the construction of yarding corridors, landings, and road construction to access some of the dead and dying trees. The District will minimize green tree removal through project design criteria and sale administrator approval as described below. The anticipated effects of all tree removal both live and dead, are considered in the Effects Section (*Effects to Habitat*) of the Assessment and this corresponding LOC.

Brimstone/Stratton Imminent Hazard Tree Removal

The District proposes to salvage trees considered immediate hazards (first year post-fire) to the public and BLM workers along roads (in both Matrix and LSR – Table 1 above) managed by the District within the Brimstone/Stratton Creek fire perimeters. Only trees meeting criteria as hazardous by the Field Guide for Danger Tree Identification and Response (Toupin et al. 2008) will be felled. Identified trees will also follow the Occupational Safety and Health Administration (OSHA) "Danger Tree" rule (29 C.F.R. § 1910.266 (h)(1)(vi)):

> *Each danger tree shall be felled, removed or avoided. Each danger tree, including lodged trees and snags, shall be felled or removed using mechanical or other techniques that minimize employee exposure before work is commenced in the area of the danger tree. If the danger tree is not felled or removed, it shall be marked and no work shall be conducted within two tree lengths of the danger tree unless the employer demonstrates that a shorter distance will not create a hazard for an employee. A danger tree includes any standing tree that presents a hazard to employees due to conditions such as, but not limited to, deterioration or damage to the tree, and direction or lean of the tree.*

Pump Chance Maintenance

The District plans to improve and maintain access to five existing water sources used in emergency wildland firefighting situations (Pump Chances). Four of the Pump Chances occur on District-managed lands whereas one occurs on private land. The District included the private land Pump Chance in their analysis because federal funds will be used for maintenance at this location, creating a federal nexus that requires consultation under the ESA. Maintenance activities at each of the five locations include reducing the amount of brush, small diameter (≤ 8" DBH) conifer, and hardwood (≤ 14" DBH) trees immediately adjacent to each water source. This clearing will allow for clear and unobstructed ingress and egress at these sites for water vehicles. Collectively, the maintenance of five individual Pump Chances amount to no more than two acres of vegetation treatments, with only ¼ of an acre cleared at any one site. In general, the majority of the vegetation removal would occur along the edge of the roadways and the areas immediately adjacent to the Pump Chances.

Road Construction

Access route and landing construction may be needed in treatment units where salvage is proposed (Table 1). All new constructed access and landings will be temporary so as to allow operators temporary access to the salvage units. After use, the temporary spur roads and associated landings would be ripped, seeded with native grasses, mulched, and blocked. The habitat effects from the road construction have incorporated into the total habitat effects for the project. All other roads and openings area are within treatment units or existing road beds.

Project Design Criteria (PDC) and Conservation Measures

For the Brimstone/Stratton salvage, roadside hazard tree removal, and pump chance projects to have effects that are insignificant and discountable relative to the spotted owl and its critical

habitat, the following PDC and Conservation Measures (see Assessment, Appendix A) were incorporated into the project:

- Seasonal restrictions (March 1-September 30) will be implemented unless surveys, following recommended protocols, indicate either non-occupancy or non-nesting of spotted owls.

- Overstory fire-killed trees (as defined above) would be retained at a minimum of two snags per acre 20″ DBH (diameter at breast height) or greater within salvage units in the Matrix LUA.

- If a new spotted owl site or alternative site is found that was not analyzed in the Assessment or this LOC, if the project area changes from what was originally analyzed in the Assessment, if a site has moved, or other information is inconsistent with what is covered in this LOC, the District will coordinate with the Service to ensure that project impacts remain consistent with this analysis. If not, the project will remain on hold until the District completes one or more of the following:

    a. Modifies the proposed action to ensure that impacts remain as described in the consultation documents;
    b. Imposes seasonal protections (if necessary);
    c. Reinitiates and completes new consultation

- Recovery Action 10: The District considered and implemented conservation measures associated with Recovery Action 10 of the 2011 Revised Recovery Plan (USDI FWS 2011) by limiting (i.e., amount, extent and strategic placement) proposed treatments that would remove NRF, foraging, or post-fire foraging habitat within known spotted owl home ranges.

- Recovery Action 12: The proposed action includes relatively higher (up to 5 five times higher/acre than Matrix standards) retention levels of large snags and coarse woody material, important habitat features of spotted owl prey species, within the spotted owl critical habitat portion of the Stratton Fire as well as within spotted owl core-use areas of the Brimstone Fire. In addition, existing down coarse wood would remain and protected to the greatest extent possible during treatment (USDI BLM Medford District 1995 RMP; p. 39). When stands are deficient in coarse woody material (a minimum of 120 feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long), merchantable material would be used to make up the deficit (USDI BLM 1995).

  Recovery Action 32: The proposed actions addressed herein will not occur within habitat meeting the characteristics of Recovery Action 32 for the spotted owl (USDI FWS 2011 and USDI BLM et al. 2010). However, individual hazard trees may be felled within areas that meet the characteristics of RA 32 and in these situations, the District plans to leave felled trees in the affected stands to provide additional course woody debris (CWD), if assessments conducted by the District determine these areas are deficient in CWD.

- Spotted Owl Critical Habitat (USDI FWS 2012): The proposed action includes removal of an insignificant amount of NRF habitat and avoids the removal of any post-fire foraging habitat within the affected critical habitat sub-unit (as detailed in the Effects to Critical Habitat section below).

Description of the Action Area

The term "action area" is defined in the implementing regulations for section 7 at 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

The action area for the activities included in this proposed action encompasses the areas affected by the salvage of burned forests associated with the Brimstone and Stratton fires, associated hazard tree removal and the vegetation maintenance of five Pump Chances. The action area also includes lands adjacent to the project areas that will be affected by project-generated, above ambient noise levels. For the purposes of this analysis, two distinct action areas were delineated because of the geographic separation of the areas. The Brimstone/Stratton salvage and associated hazard trees are all located within the same action area (Figure 1). The Pump Chance maintenance represents a second action area and as discussed in the Effects Section below, a very minor amount of habitat removal is proposed within it. The action area(s) perimeter is delineated by 1.3 mile radius distance from proposed treatment units. This 1.3 mile radius distance is analogous to the median home range of spotted owl pairs in the Klamath Province (see Spotted Owl Resource Use section below) and likely reflects the territorial movements of spotted owls for this region.

The proposed projects are planned to occur in the Oregon Klamath Mountains Physiographic Province, an area characterized by very high climatic and vegetative diversity resulting from steep gradients of elevation, dissected topography, and the influence of marine air (relatively high potential precipitation). These conditions support a highly diverse mix of xeric and mesic forest communities such as Douglas-fir/tanoak and mixed evergreen forest. The prey base of spotted owls in the action area is diverse, but generally dominated by woodrats (*Netoma spp*) and northern flying squirrels (*Glaucomys sabrinus*) (Forsman et al. 2004).

District-managed lands occur in a checkerboard pattern of ownership, with alternating one square mile sections of federal and private lands. Adjacent private lands are generally managed for wood fiber production on a relatively short rotation of approximately 40 years. Decades of fire suppression have allowed natural stands to become overstocked, creating conditions that support large fire growth. Atzet and Wheeler (1982) discuss fire as a key natural disturbance in the Klamath Province in southwestern Oregon. Spotted owl habitat patterns in these drier portions of its range are not continuous, but occurred naturally in a mosaic pattern. Agee (1993, 2003) and Hessburg and Agee (2003) characterized the historical wildfire regime as low- to mixed-severity with fire return intervals of less than 10 to 50 or more years, depending on local conditions. It is recognized that there is a high degree of variability in habitat used by spotted owls as described in research publications (see Courtney et al. 2004 and USDI FWS 2011) for the broader Klamath Province, including the Oregon portion of the province.

STATUS OF THE SPOTTED OWL AND SPOTTED OWL CRITICAL HABITAT IN THE ACTION AREA

Environmental Baseline

The District updated the environmental baseline (Table 2) of spotted owl habitat in the fall of 2013 to account for habitat loss due to the Brimstone/Stratton Fires (see Assessment for details on the update process). The environmental baseline for the Pump Chance action area is provided in the Assessment and not discussed herein because of the very minor extent of the proposed action (see Effects Section below) in the Pump Chance action area.

The Brimstone/Stratton action area (including associated hazard trees) consists of 14,024 acres, of which 6,017 acres are typed as spotted owl NRF habitat. In addition, the action area overlaps 1,752 acres of critical habitat sub-unit KLW 1, of which 800 acres are typed as NRF habitat. While capable habitat is displayed (Table 2), it does not currently function as spotted owl habitat and therefore will not be considered in the analysis because it does not have implications on effects to spotted owls under this LOC.

Brimstone and Stratton Fire Salvage, Hazard Tree Removal and Four Pump Chance Maintenance Projects (Reference Number 01EOFW00-2014-I-0105).

Figure 1. Brimstone/Stratton action area delineation on the Medford District BLM (map provided by the District).

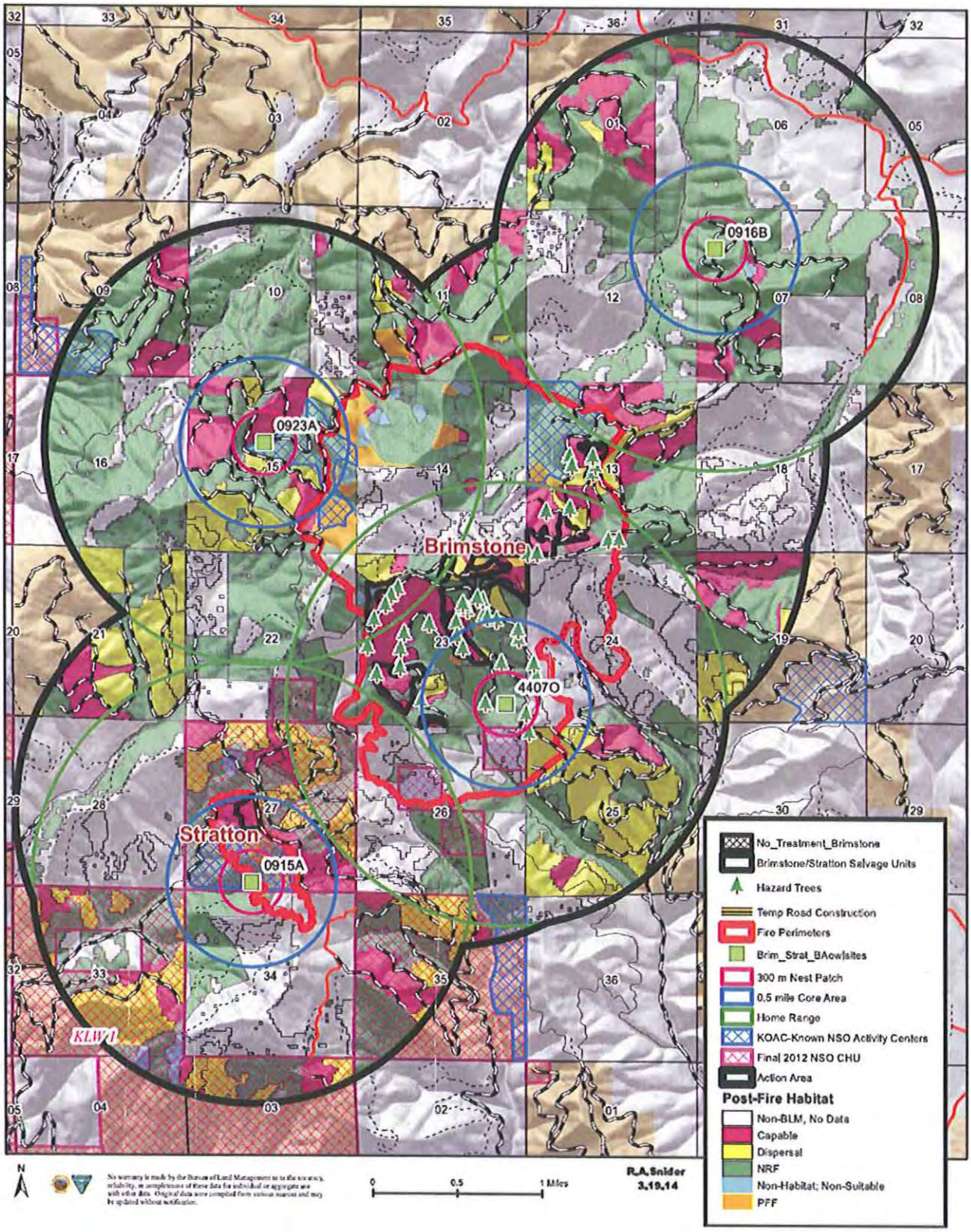

Table 2. Action area environmental baseline of spotted owl habitat for the Brimstone/Stratton fire salvage and associated roadside hazard tree removal projects on the Medford District BLM (FWS Ref # 01EOFW00-2014-I-0105).

		ACRES	NSO NRF HABITAT[1] ACRES (% TOTAL)	CAPABLE[2,4] NSO HABITAT ACRES (% TOTAL)	Reserve[3] ACRES (% OF TOTAL)	Non-Reserve[4] ACRES (% OF TOTAL)	DISPERSAL[5,2] ACRES (% OF TOTAL)
OWNERSHIP							
-All Ownerships		14,024	6,017 (43%)	1,656 (12%)	408 (3%)	13,617 (97%)	7,498 (53%)
- Non-Federal (Private, State)		7,147	2,353 (33%)	0	0	0	2,353 (33%)
-Federal (BLM, USFS,)		6,877	3,664 (53%)	1,656 (24%)	408 (6%)	6,469 (94%)	5,145 (75%)
LAND ALLOCATION - FEDERAL (*hierarchal, no acres double-counted*)							
- Administratively Withdrawn Areas		0	0	0	408 (100%)	0	0
-Late-Successional Reserves (mapped)		0	0	0			0
- 100-Acre Spotted Owl Core Areas in the Matrix		408	333 (82%)	72 (18%)			336 (82%)
-Matrix/Adaptive Management Areas [3]		6,469	3,331 (51%)	1,409 (22%)	0	6,469 (100%)	4,984 (77%)
Spotted Owl Critical Habitat							
Critical Habitat Unit	**Sub-unit**	**Acres[6]**	**NRF Habitat Acres**	**Capable NSO Habitat Acres**	**RESERVED**	**NON-RESERVED**	**DISPERSAL**
KLW 9	**KLW1**	1,752	800 (46%)	350 (20%)	146 (8%)	262 (15%)	1,300 (74%)

Notes:
1. Spotted owl nesting, roosting, foraging habitat (see Assessment for habitat definition).
2. Capable habitat is forest land that is currently not habitat but can become NRF or dispersal habitat in the future as trees mature and canopy closes.
3. Reserved = land allocation with no programmed timber harvest which includes Congressionally Reserved, LSR's, Spotted Owl Known Activity Areas and Wild and Scenic River Corridors.
4. Non-Reserve = Matrix/Adaptive Management Area (AMA) and includes Riparian Reserves (no Riparian Reserved GIS layer is available)
5. Capable and Dispersal-Only acres are primarily calculated on federal lands only in this BLM layer (BLM used the same layer to be consistent with the BA data). Dispersal includes NRF habitat because both dispersal-only and NRF habitat provide for dispersal habitat function
6. Includes CH on State Lands.

Spotted Owl

Within the Brimstone/Stratton action area, four historic spotted owl sites are located within and/or have home ranges that overlap the fire perimeter (Figure 1). These sites have had infrequent surveys during the past decade (Assessment, Table 5 and Appendix C). Within the Pump Chance area, there are four historic spotted owl sites which have been surveyed regularly because they are located within the Klamath Demography Study Area (Assessment, Table 5 and Appendix C).

While no surveys targeting barred owls have been conducted across the action areas, to date, no barred owls (*Strix varia*) have been detected at the spotted owl sites under analysis in this LOC (Assessment, Appendix C). However, barred owls are known to occur within the Klamath Demography Study area (Forsman et al. 2011) and we believe it's a reasonable assumption that barred owls also occur in the action areas given the results of Forsman et al. (2011) and Davis et al (2013).

Spotted Owl Critical Habitat

The Brimstone/Stratton action area overlaps 1,752 acres of critical habitat sub-unit KLW 1, of which, 800 acres and 1,300 acres are considered spotted owl NRF and dispersal habitat (Table 2). The Pump Chance Maintenance action area overlaps 6,257 acres of critical habitat sub-unit KLW 1, of which, 3,696 acres and 4,666 acres considered as NRF and dispersal habitat.

SPOTTED OWL RESOURCE USE

This section is provided in advance of the *Effects of the Action on the Spotted Owl* section to provide some important contextual information that helps to inform that analysis.

Because complete range-wide population surveys for the spotted owl are not available, it is a well-established analytical approach to analyze the effects of proposed activities on the spotted owl based on the extent, duration, and timing of habitat-altering activities and how those alterations are likely to affect spotted owl nesting, roosting, foraging, and dispersal behavior based on known spatial and habitat use relationships exhibited by the spotted owl (see USDI BLM et al. 1994, Lehmkuhl and Raphael 1993, Raphael et al. 1996, Meyer et al. 1998, and Courtney et al. 2004). The anticipated amount of forest habitat likely to be used by spotted owls is based on the known range of habitat conditions used by spotted owls for nesting, roosting, and foraging (see Thomas et al. 1990 and Courtney et al. 2004). In addition, the basis for a finding that a proposed action is likely to significantly impair the breeding, feeding, sheltering and/or dispersal of affected spotted owls relies on the scientifically-recognized range of habitat conditions that are known to adequately provide for spotted owl life history requirements. Spotted owls exhibit clear, consistent patterns of habitat association, and these patterns can provide the foundation for assessing the potential effects caused by land management activities. In the 1990 *Conservation Strategy for the Northern Spotted Owl,* the Interagency Scientific Committee (Thomas et al. 1990) stated that:

> "With the exception of recent studies in the coastal redwoods of California, all studies of habitat use suggest that old-growth forests are superior habitat for northern spotted owls. Throughout their range and across all seasons, spotted owls consistently concentrated their foraging and roosting in old-growth or mixed-age stands of mature and old-growth trees....Structural components that distinguish superior spotted owl habitat in Washington, Oregon, and northwestern California include: a multilayered, multispecies canopy dominated by large (>30 inches DBH) conifer overstory trees, and an understory of shade-tolerant conifers or hardwoods; a moderate to high (60-80 percent) canopy closure; substantial decadence in the form of large, live coniferous trees with deformities-such as cavities, broken tops, and dwarf mistletoe infections; numerous large snags;

> ground cover characterized by large accumulations of logs and other woody debris; and a canopy that is open enough to allow owls to fly within and beneath it."

Fifteen years later, the conclusions of the Interagency Scientific Committee were echoed in the *Scientific Evaluation of the Status of the Northern Spotted Owl* (Courtney et al. 2004), which found that the habitat attributes identified by Thomas *et al.* (1990) remain important components of spotted owl habitat. Notably, positive relationships were found with the aforementioned attributes whether the samples of spotted owl and random locations were within old-growth forest, non-old growth forest, National Parks, public land, or private land. In 2011, the *Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2011) again reiterated the association of spotted owls with older forest conditions, stating: "Spotted owls generally rely on older forested habitats (Carroll and Johnson 2008) because such forests contain the structures and characteristics required for nesting, roosting, and foraging (NRF)."

Spotted Owl Spatial Use of Forest Landscapes

A major advance in our understanding of spotted owl habitat relationships from Thomas et al. (1990) to the present is that we now have a much better understanding of the spatial scale of habitat selection (see Hunter et al. 1995, Meyer et al. 1998, Zabel et al. 2003) and the relationships of habitat to spotted owl fitness (Franklin et al. 2000, Olson et al. 2004, Dugger et al. 2005). Generally, guidance for management activities addressing territorial organisms is typically spatially explicit and such activities are applied to an area corresponding to the movements and activity patterns of the individuals of the organism occupying the territory(ies). Spotted owls are territorial raptors that range widely in search of prey but are 'anchored' during the breeding season to a nest site (Rosenberg and McKelvey 1999). That is, spotted owls are a central-place forager. Foraging close to the nest reduces travel time and energetic expenditures of adults and also increases the ability of the adults to remain nearby and protect their young. Several studies have shown that spotted owls optimize selection of their nest sites to maximize the amount of older forest habitat close to the nest (see Ripple et al. 1991, Ripple et al. 1997, Swindle et al. 1999, and Perkins 2000) in addition to selecting habitat on a larger landscape basis (Ripple et al. 1997 and Swindle 1999). On that basis, evaluations of spotted owl spatial use of an area and habitat are most meaningfully conducted at two spatial scales: the home range and core-use area, recognizing that habitat selection at a larger home range scale is likely dependent on the smaller core-use area (see Johnson 1980 for hierarchy of habitat selection).

The home range is the "area traversed by the individual in its normal activities of food gathering, mating, and caring for young" (Burt 1943:351). Within home ranges, areas receiving concentrated use, typically surrounding the nest site and favored foraging areas, are called core areas (Bingham and Noon 1997). Establishing the exact spatial extent of a spotted owl's home range and core area based on relative use within a home range typically requires use of radio-telemetry. Because of the intensity and high cost of radio-telemetry, action agencies are not able to conduct this type of study for specific projects. Therefore, for the purposes of assessing a project's potential impacts to the spotted owl, the Service approximates circles of similar size to the provincial median home range and core-use area estimates of spotted owls (see home range estimates in Thomas et al. 1990 and reaffirmed in Courtney et al. 2004), centered on spotted owl nest sites or activity centers (see below).

There are numerous analytical techniques for estimating home range sizes based on animal locations (reviewed in Powell 2000). For estimating median annual home range size of spotted owl pairs in Oregon (and elsewhere in the spotted owl's range), the estimator typically used was the minimum convex polygon or MCP method (Thomas et al. 1990 and USDI FWS 1992). Because the MCP estimates are generally large (as compared to other methods), they provide relatively conservative values on which to base the outer habitat-analysis area in that they include distant but likely important patches of habitat in such home ranges.

Resources such as food and breeding and resting sites can be patchily distributed in heterogeneous landscapes, such as those prevalent throughout the NWFP provinces. In such landscapes, animals are likely to disproportionately use areas that contain relatively high densities of important resources (Powell 2000), with concentrated use close to their nests. These disproportionately used areas are referred to as "core areas" (Bingham and Noon 1997). Thomas et al. (1990) found that amounts of suitable habitat within 0.7 miles (986 acres) of spotted owl activity centers were important to spotted owl life history functions, and that the amount of suitable habitat around nest sites was significantly greater than the amount of suitable spotted owl habitat in random circles. The findings of Thomas et al. (1990) illustrate the importance of the amount of suitable habitat within a spotted owl territory to support the life history requirements of the spotted owl. The results of subsequent studies (see below) have also indicated that a 0.5-mile radius circular area encompassing 500 acres around spotted owl activity centers is likely a more appropriate scale at which to evaluate the amounts of suitable habitat required by breeding spotted owls (USDI FWS 2009a and USDI FWS 2011 Appendix C). These studies relied on three primary sources of information to support the 500-acre core area size: (1) the distribution of locations of radio-telemetered spotted owls; (2) the territorial spacing patterns of spotted owls; and (3) the results of studies comparing relative habitat selection by spotted owls at different scales.

Based on best available information, we are utilizing the documented spotted owl spatial use patterns of home range and core-use areas to inform potential project effects to the species. However, because of the impracticality of conducting radio-telemetry on each individual owl potentially affected, the Service uses circles as surrogates for approximating spotted owl home range and core–use areas to inform impacts to the species. It is recognized that spotted owls may adjust the shape of their home ranges to encompass as much older forest habitat as possible (Carey et al. 1992). As such, the use of circles may not correspond exactly with the areas used by spotted owls and may be more defined by other factors such as topographic features (e.g., drainages), abundance and availability of prey species, and the distribution and/or abundance of competitors and predators (Anthony and Wagner 1998 and Courtney et al. 2004). However, the practice of using circles has a biological basis (Lehmkuhl and Raphael 1993), and has been utilized by many researchers (Thomas et al. 1990, Ripple et al. 1991, Lehmkuhl and Raphael 1993, Ripple et al. 1997, Swindle et al. 1999, Perkins 2000, Franklin et al. 2000, Olson et al. 2004, Dugger et al. 2005, and see summary in Courtney et al. 2004) by providing a uniform method for quantifying (comparing/contrasting) spotted owl habitat. The use of circles also seems appropriate for species, like the spotted owl, characterized as a "central place species." The use of circles, as described herein that correspond to MCP estimates should be large enough to include habitat to meet all major life history needs and include areas important to both members of most pairs.

Based on the median MCP home range estimate for spotted owl pairs, the following estimates by NWFP Province help inform a spotted owl spatial analysis for Oregon: Coast Ranges Province = 4,524 acres or a circle with a 1.5-mile radius; West Cascades Province = 2,895 acres or a circle with a 1.2-mile radius; and the Klamath Province = 3,398 acres or a circle with a 1.3- mile radius. Within a home range, the smaller core-use area estimate of 500 acres or a circle with a 0.5 mile radius inform the spotted owl core-use area analysis for each of the aforementioned provinces (Thomas et al. 1990, USDI FWS 1992, Carey et al. 1992, Anthony and Wagner 1998, Irwin et al. 2000, Courtney et al. 2004, Glenn et al. 2004 and USDI FWS 2011). For purposes of this analysis, the core-use/home range area circle(s) will be centered on a spotted owl activity center that represents the area that spotted owls are likely to use for nesting and foraging in any given year. In situations where there is local information available on home range and core-use areas, those estimates should be given consideration for use.

Habitat Availability in Spotted Owl Core Areas and Home Ranges

Best available information indicates that spotted owl sites that are occupied over the long-term are positively associated with mosaics of forest habitat at the provincial core-use area and home range scales that are capable of providing the resources necessary to meet the essential life functions of individual spotted owls.

Core Area

Recently developed habitat-fitness (see below) and landscape models and other publications have demonstrated the validity of the core-use area and the importance of having sufficient amounts of NRF habitat within spotted owl core areas to adequately provide for spotted owl survival and reproduction, and access to prey (Franklin et al. 2000, Olson et al. 2004, Dugger et al. 2005, Zabel et al. 2003). Best available information to date indicates that spotted owl survival and fitness are positively correlated with large patch sizes of older forest or large forest patches containing a high proportion of older forest (Franklin et al. 2000, Olson et al. 2004 and Dugger et al. 2005). Habitat-based fitness, or habitat fitness potential (HFP), is the "fitness conferred on an individual occupying a territory of certain habitat characteristics" (Franklin et al. 2000). HFP is function of both the survival and reproduction of individuals within a given territory. For example, the data sets analyzed by Franklin et al. (2000) were re-analyzed to evaluate the relationship between HFP and the simple proportion of older forest within spotted owl core areas. The results of that analysis (USFWS Service 2007, Appendix D), indicate a quadratic relationship between spotted owl HFP and older forest conditions, with optimum HFP occurring when 53 percent of the estimated core area consisted of older forest (Franklin et al. 2000). More than half (55 percent) of the high-quality (with a HFP greater than 1) spotted owl territories had core areas comprised of 50 to 65 percent older forest. In a similar study in southern Oregon, Dugger et al. (2005) found that spotted owl HFP was positively related to the proportion of older forest in the core area, although the strength of the relationship decreases with increased proportions. Roughly 72 percent of core areas with a HFP greater than 1.0 had more than 50 percent older forest; whereas core areas with a HFP of less than 1.0 never contained more than 50 percent older forest.

Collectively, researchers (Hunter et al. 1995, Ripple et al. 1997, Gutiérrez et al.. 1998, Meyer et al. 1998, Franklin et al. 2000 and Dugger et al. 2005) have reported a wide range (ca. 35 to 60

percent) of mean proportions of older forest at the core area scale around spotted owl nests in southwest Oregon and northwest California. It is difficult to assess how much of this variation was due to differences in ecological setting, spatial scale, habitat classification, and individual variation among owls. Nonetheless, the central tendency of these results was roughly 50-60 percent older forest habitat within spotted owl core areas. Older forest is more likely than other vegetation classes to provide the spotted owl with suitable structures for perching and nesting, a stable, moderate microclimate at nest and roost sites, and visual screening from both predators and prey.

Annual Home Range

Bart (1995) evaluated the suggestion in the 1992 draft recovery plan for the spotted owl (USDI FWS 1992) that at least 40 percent of the estimated home range be retained as suitable habitat. Using demographic data from throughout the spotted owl's range, including Oregon, Bart (1995) calculated that spotted owl populations are stable when the average proportion of NRF habitat in the home range is 30 to 50 percent. Olson et al. (2004) found for their Oregon Coast Ranges study area that mid and late-seral forest is important to spotted owls, but also found that a mixture of these forests with early seral forest improved spotted owl productivity and survival. Spotted owl demography and the presence of spotted owls appear to be positively associated with an intermediate amount of horizontal heterogeneity in forest habitat at the home range scale (Schilling et al. 2013); findings reported in more recent papers (see USDI FWS 2009) have been consistent with those of Bart (1995).

Site Occupancy

Habitat-based assessments and/or modeling have been used in various studies to estimate the presence (occupancy) of breeding spotted owls; these tools are important for evaluating the species-habitat relationships. Bart (1995) reported that occupied spotted owl core areas contained at least 30 to 50 percent mature and old growth forest and spotted owl demographic performance, particularly occupancy, increases with increasing amounts of NRF habitat in the core area. Meyer et al. (1998) examined landscape indices associated with spotted owl sites versus random plots on BLM lands throughout Oregon. Across provinces, landscape indices highly correlated with the probability of spotted owl occupancy included the percent of older forest (approximately 30 percent) within the 500 acres (analogous to a core area) surrounding the site (and this predictive value decreased with increasing distance) and that site occupancy decreased following the harvest of NRF habitat in the vicinity of the affected core area. Zabel et al. (2003) found for their northwest California study area that the highest probability of spotted owl occupancy occurred when the core area is comprised of 69 percent nesting/roosting habitat. Stepping up to the larger home range scale, Thomas et al. (1990), Bart and Forsman (1992), Bart (1995), Olson et al. 2004, and Dugger et al. (2005) suggest that when spotted owl home ranges are comprised of less than 40 to 60 percent NRF habitat, they were more likely to have lower occupancy and fitness.

The Service recognizes that many different combinations of forest habitat structure and amount at various spatial scales may support viable spotted owl territories sufficient for the survival and reproduction of individual owls. Despite consistent patterns of habitat selection by spotted owls, structural conditions of forest habitats occupied by spotted owls are highly variable. However,

overall, the best available information suggests that: (1) the probability of spotted owls occupying a given patch of forest habitat is increased when core areas contain a range of forest habitat conditions that support the essential life history requirements of individual spotted owls; and (2) the survival and fitness of spotted owls are positively correlated with larger patch sizes of older forest or larger patches of forest habitat with a high proportion of older forest (Franklin et al. 2000, Olson et al. 2005 and Dugger et al. 2005).

Dispersal Habitat

As for dispersal habitat considerations, the effects analysis for the spotted owl in this Opinion is informed at a landscape scale, as suggested by Thomas et al. (1990) along with Lint et al. (2005) and Davis et al. (2011). Typical dispersal-only habitat is characterize as forest stands less than 80 years old, of simple structure, and providing some foraging structure and prey base for spotted owls as they disperse across the landscape. An assessment of dispersal habitat condition was recommended on the quarter-township scale by Thomas et al. (1990); the Service has subsequently used a fifth field or larger landscapes for assessing dispersal habitat conditions because watersheds or provinces offer a more biological meaningful way to conduct the analysis.

EFFECTS OF THE PROPOSED BRIMSTONE/STRATTON FIRE SALVAGE, ASSOCIATED HAZARD TREE REMOVAL AND PUMP CHANCE PROJECTS ON THE SPOTTED OWL

Overview of Potential Fire Effects on Spotted Owls

The effects analysis within this LOC differs from analyses typically conducted for green tree timber harvest largely due to the differences in how spotted owls use a landscape the first several years after a wildfire. For the purposes of this analysis, we rely on general observed habitat use patterns reported in the literature to base our assessment of the likely effects of post-fire management activities, such as salvage, fuels reduction, or hazard tree mitigation on spotted owls, given our understanding of their use of burned landscapes. Our evaluation, we believe, is consistent with the high degree of variability in habitat used by spotted owls, as described in research publications and our assessment of the range of stand conditions frequently used by spotted owls post-fire (see Spotted Owl Resource Use section above and Appendix 1 herein).

Specific terms are used herein to categorize the estimated degree of change (potential effect) to spotted owl habitat elements. For example, the term *treat and maintain* indicates that changes in the habitat may be neutral or beneficial to habitat function even though the habitat element may be modified. The term *remove* signifies when treatments may have a negative influence on the quality of habitat by the removal or reduction of spotted owl habitat elements. Determination of the significance of habitat change resulting from proposed activities, and whether these changes are likely to adversely affect spotted owls or their critical habitat, must also be based on analysis of site, treatment, and scale dependent factors.

To understand the context of fire effects to spotted owl habitat within the Brimstone/Stratton action area and to spotted owl sites therein, the pre and post-fire habitat condition were evaluated (Assessment, Table 6). Overall, one site (0916B) experienced no change to habitat while a 2, 11,

and 19 percent reduction occurred in NRF habitat at the home range scale at the three other sites 0923A, 0915A, and 4407O, respectively, in the action area due to the fires.

Potential Effects of Habitat Modification

Under the District's proposed action approximately 187 acres are proposed for treatment (Table 3), of this total, approximately 104 acres is considered capable but non-habitat (these acres are not shown here; see Table 2 above for Capable definition). The discussion below considers each of the activities impacting spotted owl habitat in more detail.

Table 3. Summary of anticipated impacts (acres) to spotted owl habitats within the Brimstone/Stratton and Pump Chance Action Areas on the Medford District BLM. Treatment definitions are provided above (FWS Ref # 01EOFW00-2014-I-0105).

Action Areas	NRF Removed	NRF Treat and Maintained	Post Fire Foraging Removed	Dispersal Removed	Dispersal Treat and Maintained
Brimstone/Stratton Salvage	0.63	51	10	0.6	15
Brimstone/Stratton Hazard Tree removal	0	2	0	0	2
Pump Chance maintenance	0	0	0	2	0
TOTAL	**0.63**	**53**	**10**	**2.6**	**17**

Post-Fire Salvage

Treat and Maintain

Salvage is proposed through treat and maintain prescriptions in 51 acres and 15 acres of NRF and dispersal-only habitat. As provided above, treat and maintain prescriptions are anticipated to continue to provide a similar habitat function post-treatment as the pre-treatment condition. For example, the stands are anticipated to have sufficient basal area and canopy cover post treatment, at or above 60 and 40 percent for NRF and dispersal-only habitat that is likely to provide vertical forest structure for spotted owl foraging perches, suitable microclimate and concealment cover for predator avoidance. Snag and downwood conditions would also be retained as untreated patches of burned trees/snag within the treatment units. These conditions provide denning and foraging habitat for spotted owl prey species such as mice, voles, and woodrats. As a result of the prescriptions retaining key habitat elements within the stands post-treatment as well as retaining large areas of post-fire foraging habitat (see below), the Service anticipates the proposed maintain treatments will have insignificant effects to spotted owls.

Post-fire Foraging Habitat Removal and NRF removal

The proposed action would remove approximately 10 acres of habitat categorized as post-fire foraging habitat. We define post-fire foraging habitat for the spotted owl as habitat that was typed as NRF before the fire, and which burned at high and moderate burn severity levels (BARC soil severity data). Even with the loss of canopy cover and key habitat components due to the fire, this habitat may still function as foraging habitat after the fire, depending on patch size, edge type, and proximity to known owl sites (Bond et al 2002, Bond et al. 2009; Clark 2007, Clark et al. 2011, and Clark et al. 2013). As described in the effects to spotted owls section below, the loss of this habitat is anticipated to be insignificant due to the spatial aspects of the units in combination with retention of a large portion of the area in post-fire foraging habitat.

Up to 0.63 acres (Brimstone = 0.5 ac and Stratton = 0.13 ac) of NRF habitat is proposed for removal due to the construction temporary- route access to the salvage units. The proposed access routes are located within relatively low habitat suitability (USDI FWS, 2012) for spotted owls because the habitat is located on the upper one-third of the slope, tending to the ridgeline. Best available information suggests that spotted owls generally do not nest or forage in the upper portions of the slope (Anthony and Wagner 1998, Clark 2007, Schilling 2013, Blakesley et al. 1992, and Courtney et al. 2004); therefore, effects to spotted owls are anticipated to be minimal by road placement in this location. The proposed road locations also occur on the edge of larger blocks of contiguous habitat and we anticipate the interior conditions to retain their current habitat function suitable for spotted owl use.

Hazard Tree Removal

An estimated four acres of spotted NRF (2 acres) and dispersal-only (2 ac) acres of habitat will be treated and maintained due to hazard tree removal (four acres are also proposed in capable habitat). This activity will largely consist of the removal of scattered individual trees within stands, affecting approximately 0.125 acres per tree (Assessment). As provided above, this type of treatment is anticipated to continue to provide a similar habitat function post-treatment as the pre-treatment condition. For example, the stands are anticipated to have canopy cover at or above 60 and 40 percent for NRF and dispersal-only habitat which should provide spotted owls microclimate conditions and concealment cover for predator avoidance. The small density and broad distribution of the hazard tree removal is anticipated to minimize edge effects by not creating large pockets of openings in the affected stands.. Some openings that create early-seral conditions may be advantageous to spotted owl prey, for example woodrats, because of their increased relative abundance in early successional plant communities (Sakai and Noon 1993) and this may benefit spotted owls hunting the edges of these stands (Folliard 1993 and Irwin et al. 2013).

Pump Chance Maintenance

Up to two acres of dispersal-only type habitat is proposed for removal associated with the five Pump Chance maintenance projects. The removal of this habitat is widely distributed across three BLM and private-lands square mile sections. Facilitation of spotted owl movements, in particular natal movements, have long been assessed at the landscape scale, and as being a

function of the percent land cover in forest habitat in a minimum structural condition (for example, the "50-11-40" rule described by Thomas et al. 1990). Thomas et al. (1990) concluded that landscapes consisting of at least 50 percent spotted owl dispersal habitat are more likely to successfully accommodate dispersing spotted owls. Within the Pump Chance action area, spotted owl habitat connectivity appears to be sufficient in that over 60 percent of the 9,310 action area currently provides dispersal habitat condition (Assessment, Table 4 [Brimstone/Stratton action area has > 53 percent dispersal habitat, Table 2 herein]). The Service anticipates that the removal of two acres of dispersal-only habitat is not likely to preclude dispersal function on the Pump Chance action area, when viewed in the context of the Thomas et al. (1990) recommendations. Additionally, dispersal habitat function and connectivity for spotted owls do not appear to be limiting in the larger surrounding Oregon Klamath Province or in the NWFP area (Lint et al. 2005, Davis et al. 2011 and Forsman et al. 2002).

For the District's entire proposed action as described herein, we anticipate that the removal of approximately 13 acres (Table 3) of dispersal quality habitat represents an insignificant impact to habitat across the respective action areas in that it is not likely to represent a barrier or a significant effect on the ability of spotted owls to disperse or move through this landscape post-harvest.

In summary, the District's is proposing to conduct habitat maintain treatments in up to 70 acres of spotted owl habitat (NRF plus dispersal-only) and remove up to 12 acres of spotted owl habitat (Table 3). The treatment of 70 acres is anticipated to have insignificant effects to spotted owl habitat because habitat function is being retained post-treatment. The removal of approximately 12 acres is anticipated to impact much less than one percent of spotted owl habitat in the action area (Table 2). Because of this minimal impact in combination with strategic placement of the treatments as mentioned herein, the Service anticipates the proposed action to be discountable and is not likely to change the capacity of the remaining habitat to provide for spotted owl breeding, feeding or sheltering activities.

Potential Effects to Spotted Owls

There are four known spotted owl sites associated with the Brimstone/Stratton Creek and hazard tree removal projects; however, only two of the sites (0915A and 4407O) (Table 4) are anticipated to have potential impacts due to habitat modification, specifically due to the road construction and the removal of post-fire foraging habitat. Another four spotted owl sites are associated with the Pump Chance project; however, these sites will not have further analysis herein because no NRF habitat will be modified and only two acres of dispersal-only habitat will be impacted across the entire Pump Chance action area, which we anticipate is an insignificant impact to spotted owls for reasons described above in the Effects to Habitat section. PDC as described above will further avoid and minimize potential impacts to spotted owls under this proposed action.

Spotted owl sites in this consultation are analyzed based on the site specific circumstances of the treatment units in relation to the demonstrated spatial relationships of spotted owl core-use and home range areas (*Spotted Owl Resource Use* section above). Two spotted owl sites, 0915A and 4407O (Table 4), are potentially impacted due to the proposed action's habitat removal. For the purposes of this consultation and as described in the Assessment, the District considers these two

sites as likely occupied by spotted owls because of habitat conditions sufficient to support occupancy (USDI FWS 2011).

Table 4. The extent of NRF and Post Fire Foraging habitat acres within spotted owl core-use areas (0.5 mile radius) and home ranges (HR) (1.3 mile radius)[1,2] affected by the Medford District BLM's Brimstone/Stratton Fire Salvage and associated Hazard Tree Removal Projects (FWS Ref # 01EOFW00-2014-I-0105).

NSO Activity Center	NRF acres Removed from the Project		PFF acres Removed from the Project		NRF Treat and maintain from the Project		Post-Project NRF Acres and % (0.5 core)	Post-Project NRF Acres and % (1.3 HR)	Post-Project NRF+PFF Acres and % (0.5 core)	Post-Project NRF+PFF Acres and % (1.3 HR)
	0.5 Mile	1.3 Mile	0.5 Mile	1.3 Mile	0.5 Mile	1.3 Mile				
0915A	0.13	0	0	0	0	0	140.87 (28%)	724.87 (22%)	165.87	749.87
0916B[3]	0	0	0	0	0	0	237 (47%)	798 (24%)	237 (47%)	798 (24%)
0923A	0	0	0	0	0	5	220 (44%)	1,000 (29%)	231	1,116
4407O	0	0.5	0	10	1	50	177 (35%)	741.5 (22%)	180	758.5

[1] Spotted owl core use and home range areas are described in the Spotted Owl Habitat Use section of this LOC.
[2] Acres in this table represent Federal-only
[3] The home range of 0916B is within the Action Area and within the fire perimeter of the Brimstone Fire, but no units are proposed within the home range.

For both spotted owl sites, 0915A and 4407O, the following project design conditions apply which minimize impacts to spotted owls. For example, areas of moderate burn severity that still contain green/live trees within the 0.5 mile core-use areas will not be salvaged. These trees and the stands that contain them likely continue to provide conditions for spotted owl roosting, such as relatively high canopy cover and concealment from predators. Relatively greater amounts of snag and coarse woody material (see BLM RMP standards) are proposed for retention in high burn severity within the core-use areas. These structures are anticipated to provide habitat refugia (denning and travel cover) for spotted owl prey. In post-fire landscapes, Clark (2007) reported that spotted owls are more likely to select habitats in areas of lower elevation and/or close to perennial streams where available. The Brimstone/Stratton temporary road construction and salvage unit(s) placement are near the ridge top/upper portion of the slope, in areas used less frequently by spotted owl which reduces potential impacts to foraging individuals. Lastly, riparian areas within the Brimstone/Stratton Creek Fire projects will not be treated and this will

help retain habitat for both spotted owls and their prey thereby minimizing potential adverse impacts (Assessment, pg. 27).

Site 0915A

According to the Assessment, this spotted owl activity area (site) received limited surveys in the past 10 years (see Assessment - Appendix C) and 2000 was the last year a pair of spotted owls and successful reproduction was verified at this site. As previously mentioned, the District conservatively assumes that this site is likely to be occupied because sufficient habitat conditions remain post-fire and spotted owl sites in the action area tend to be utilized by spotted owls (see Assessment), even after long periods of un-occupancy if sufficient habitat exists (USDI FWS 2011).

The temporary road construction is expected to remove 0.13 aces of NRF habitat (Table 4) and up to 11 acres of capable (non-habitat). As described above, several project design features minimize impacts to spotted owls due to the strategic placement and very limited spatial extent of the proposed action. At the home range scale, large untreated burned areas are anticipated to provide post-fire foraging habitat, in addition to an area of contiguous unburned green habitat that occurs around the nest site, west of the fire. As a result of these planning features, the Service anticipates that the proposed action may affect but is not likely to adversely affect spotted owls at site 0915A due to an insignificant amount of NRF habitat affected within the home range of this site.

Site 4407O

According to the Assessment, this spotted owl activity area received limited surveys during the past decade (and greater) and 2000 was the last record a pair of spotted owls was verified at this site; however, single spotted owls were detected in 2008 and 2009. For similar reasons as discussed above for site 0915A, the District assumes site 4407O to be occupied for the purposes of consultation.

No NRF or post-fire foraging habitat is proposed for removal or downgrading in the core-use area. The proposed action includes the salvage of up to 10 acres of post-fire foraging habitat as well as the removal of 0.5 acres of NRF habitat due to temporary road construction within the home range. As described above, several project design features minimize impacts to spotted owls due to the strategic placement and limited spatial extent of the proposed action. Besides occurring outside of the core-use area, these features include road placement and many of the salvage units are proposed along the upper portions of slopes that receive limited use by spotted owls and also correspond to areas of relatively low habitat suitability. As a result of these planning features, the Service anticipates that the proposed action may affect but is not likely to adversely affect spotted owls at site 4407O.

Sites 0916B and 0923A

No adverse effects are anticipated to spotted owls at sites 0916B and 0923A because habitat will be maintained as described above in the *Effects to Habitat* section and/or the home range of the site overlaps the action area but no activities are planned within this home range.

Potential Influence of Barred Owls

Barred owls are recognized as a significant threat to the recovery of the spotted owl (USDI FWS 2011). As mentioned above, barred owls have not been detected during the very limited spotted owl surveys at spotted owl sites within the Brimstone/Stratton action area. We anticipate that barred owls do occupy the action area given the increasing abundance of barred owls on the nearby Klamath Demography Study area (Davis et al. 2013). There is no evidence that salvage or hazard tree removal creates conditions favorable to barred owls and would subsequently facilitate their expansion into an area occupied by spotted owls (see USDI FWS 2013 and USDI FWS 2011). Our evaluation of the Project therefore focused on whether the proposed treatments could potentially act to further exacerbate further competitive interactions between the two species by reducing the availability of high-quality habitat (see Recovery Plan section below). As described above, the treatments proposed in the project have an insignificant affect to spotted owl habitat, and therefore, it is unlikely that the Project will exacerbate competitive interactions between the two species.

Potential Disturbance Effects of the Proposed Action on Spotted Owls

The proposed action includes multiple activities that may result in disturbance or habitat modification to spotted owls. These include salvage, hazard tree felling, vegetation clearing, yarding, hauling and other activities as described in the Assessment. To reduce the potential for project activities to disturb spotted owls and their nestlings, seasonal restrictions (March 1-September 30) and/or limiting activities within the disruption distances will be implemented. As a result of this design feature, the Service does not anticipate adverse effects to spotted owls due to disturbance.

Potential Effects of the Proposed Action from the Perspective of the Northwest Forest Plan (NWFP) and Revised Recovery Plan for the Spotted Owl

NWFP

Two potential hazard trees are located in a NWFP 100 acre core area, which are to be managed as LSRs. Therefore the objective for hazard tree removal would meet the following Northwest Forest Plan Standard and Guidelines:

- "Removal of snags and logs may be necessary to reduce hazards to humans along roads and trails, and in or adjacent to campgrounds. Where materials must be removed from the site, as in a campground or on a road, a salvage sale is appropriate. In other areas, such as along roads, leaving material on site should be considered. Also, material will be left where course woody debris is inadequate (NWFP, C-15)."
- Road maintenance may include felling hazard trees along rights-of-way. Leaving material on site should be considered if available coarse woody debris is inadequate. Topping trees should be considered as an alternative to felling (NWFP, C-16)."

The two trees felled in the 100 acre core areas are along the road and occur as scattered individual trees within stands affecting approximately 0.125 acres per tree (0.25 total acres) (Table 1 indicates up to 2 acres total). The affected acres would be insignificant compared to the amount of habitat untreated and retained within surrounding stand. Additionally, these trees would be retained on site as CWD if they are outside of the road prism (Assessment pg. 17).

Recovery Actions 10, 12, and 32

Recovery Action 10 – Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl populations.

The project is consistent with RA 10 because the proposed projects have been planned in a manner that 1) avoids activities within the nest patches of known spotted owl sites, 2) limits the removal of NRF through strategic placement of harvest units (as described above), and 3) will be implemented in a manner that avoids disturbance by restricting activities within the breeding season.

Recovery Action 12 – In lands where management is focused on development of spotted owl habitat (e.g., LSR, critical habitat) post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e..g, large trees, medium and large snags, downed wood).

The District is proposing to salvage less than 12 percent (177 acres) of the 1,520 acres burned on lands managed by the District and as a result, large snags and CWD will be maintained throughout a significantly large portion of the action area. As hazard tree felling or salvage represents a narrow band along roadsides and very small units (one to 28 acres in size) post-fire biological legacies will more than sufficiently be retained post-treatment.

Recovery Action 32 - *"Because spotted owl recovery requires well distributed, older and more structurally complex multi-layered conifer forests on Federal and non-federal lands across its range, land managers should work with the Service as described below to maintain and restore such habitat while allowing for other threats, such as fire and insects, to be addressed by restoration management actions. These high- quality spotted owl habitat stands are characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees."*

The proposed action is consistent with RA 32 in that high quality spotted owl habitat (USDI BLM et al. 2010) is not receiving salvage treatments; however, individual hazard tree removal may occur. As stated above, in these situations, the District will leave cut trees on site if a determination is made that coarse wood amounts are deficit.

Effects of Interrelated and Interdependent Activities

Proposed projects in this LOC have interrelated and interdependent affects such as noise, road construction or timber hauling on existing system roads, and post-harvest brush disposal. Post project fuels reduction of the activity fuels may include biomass removal and pile burning. The Service anticipates that none of these treatments are likely to alter habitat function.

Cumulative Effects on the Spotted Owl

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur within the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

State, County and Private-owned lands within and adjacent to the action area are primarily managed as industrial forest lands, and generally on short timber harvest rotations of approximately 40 years. According to the Assessment, State and private lands comprise approximately half of the acres in the Brimstone-Stratton action area. However, these lands are not expected to notably contribute to the viability of this species, given the management practices on those lands. Portions of these lands do not currently provide any habitat. In addition, both the Brimstone and Stratton fires burned portions of these non-federal lands, and timber harvest has already taken place on these lands.

Based on best available information provided in the Assessment, forest habitat conditions on these lands are not expected to improve significantly within the foreseeable future. To date, Oregon Forest Practice Rules have not adopted any regulations that specifically provide protection to spotted owls, other than a 70-acre nest site protection. Implementation of timber harvest activities that may occur on non-Federal lands in and adjacent to the action area have the potential to adversely affect individual spotted owl home ranges. However, the Service finds that no significant cumulative effects to the spotted owl are likely to occur on non-Federal lands in the action area for this consultation due to the current degraded condition of forest habitats on these lands relative to the life history requirements of the spotted owl.

POTENTIAL EFFECTS OF THE PROPOSED ACTION ON SPOTTED OWL CRITICAL HABITAT

The salvage unit associated with the Stratton Fire and all of the Pump Chance Clearing projects are within spotted owl critical habitat unit 9, subunit KLW1(USDI FWS 2012). This unit totals 147, 246 acres, consisting of over 73,000 acres of NRF habitat and over 119,000 acres of dispersal and better quality habitat (Assessment, Table 7). Federal lands are managed as directed by the NWFP (USDA FS/USDI BLM 1994, entire). Special management considerations or protection are required in this subunit to address threats to the essential physical or biological features from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support to the overall population and for north-south and east-west connectivity between subunits and critical habitat units. This subunit sits at the western edge of an important connectivity corridor between coastal Oregon and the western Cascades.

Collectively, up to 3.7 acres of spotted owl critical habitat Primary Constituent Elements (PCEs) are likely to be impacted by the proposed action. This consists of 0.13 acres in PCE 2 (nesting and roosting habitat) and PCE 3 (foraging habitat) and 2.6 acres in PCE 4 (dispersal habitat) (Assessment, Table 11). Approximately 1 acre of dispersal habitat (PCE 4) will have treatment but not to the degree where the existing habitat function is changed that would support the life history requirements of the spotted owl. This is because these habitat functions operate at the scale of hundreds and thousands of acres of habitat.

Because the habitat classification described in this document, see *Effects to Habitat* section above, equates to PCEs, that section was used to inform effects to spotted owl critical habitat. For example, the removal of dispersal habitat is not likely to impact the connectivity function of the subunit because only a minor amount of habitat (much less than one percent) will be removed

at the smaller action area scale; therefore, connectivity post-treatment is not likely to preclude spotted owl movement within and outside of the subunit. Similarly, the intended demographic function of the subunit is not anticipated to be impacted by the proposed action because spotted owl sites in this analysis are not likely to be adversely effected. Therefore, breeding, feeding, and sheltering activities are not anticipated to appreciably diminish. Because the Service considers the effects to PCEs of critical habitat to be insignificant at the local scale, no further analysis is need at the larger subunit KLW1 scale. As a result, the Service concurs with the District's determination that the proposed action may affect, but is not likely to adversely affect spotted owl critical habitat.

Conclusion

Based on the very minor scale and extent of habitat modifications anticipated with the Brimstone/Stratton Fire Salvage, associated Hazard Tree Removal and Pump Chance maintenance projects, inclusive of PDC and conservation measures to avoid or minimize adverse effects to the spotted owl and its habitat, including spotted owl critical habitat, the Service concurs with the District's determination that the proposed action is ***not likely to adversely affect*** the spotted owl and spotted owl critical habitat.

REINITIATION NOTICE

This concludes informal consultation on the proposed action outlined in your Assessment. The enclosed LOC includes the Service's determination that the District's proposed action is not likely to adversely affect the spotted owl or spotted owl critical habitat. The Assessment includes a finding that it may take several years to fully complete the proposed actions. Please note that the enclosed LOC remains valid for the term of each action as discussed in this document. In accordance with the implementing regulations for section 7 at 50 CFR 402.16, re-initiation of consultation on one or both of these proposed actions is required where discretionary Federal agency involvement or control over the actions has been maintained (or is authorized by law) and if: (1) the amount or extent of exempted incidental take is exceeded; (2) new information reveals effects of the agencies' action that may affect listed species or critical habitat in a manner or to an extent not considered in the LOC; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the LOC; or (4) a new species is listed or critical habitat designated that may be affected by one or both of these actions. When consultation is reinitiated, the provisions of section 7 (d) of the ESA apply.

Please contact Cindy Donegan at 541-618-2374, if you have any questions regarding this response.

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APPENDIX 1. EVALUATING EFFECTS OF WILDFIRE TO NORTHERN SPOTTED OWLS AND THEIR HABITAT[1]

The purpose of this Appendix is inform and help evaluate the effects of wildfire on the spotted owl and its habitat because there are many influences on how spotted owls may use post-fire landscapes, and the likely or expected response of the species to post-fire management activities. This approach suggests two steps in which you: 1) update the pre-fire environmental baseline using existing literature to aid in evaluating the effects of fire to the pre-fire spotted owl occupancy, habitat use and habitat availability within the action area; and 2) evaluate the effects of the project on the established post-fire baseline habitat conditions and best available information spotted owl occupancy and habitat use. This framework establishes the assumptions (and uncertainties) on which we base our analysis of the effects. Consistent with habitat-based effects analyses for un-surveyed landscapes, where surveys of spotted owl habitat in the Action Area are not current, potentially occupancy of an area should consider the extent of patches of habitat of sufficient size, and amount and quality that may confer occupancy (see Spotted Owl Resource Use or Status of the Species sections of the Opinion). As always, site specific conditions, in as much as possible, should be used to inform spotted owl occupancy, habitat use, and potential effects to the species.

Fire Effects on Spotted Owls

Research on all three spotted owl subspecies (northern, California, and Mexican) indicates variability and a high level of uncertainty in the degree to which spotted owls use post-fire landscapes. Comprehensive analyses of the effects of fire on northern spotted owl use and occupancy within a landscape, especially the small scale effects to pairs or individuals, are largely absent or inconclusive. This is due, in part, to the stochastic nature of wildfire and the difficulty of empirically testing hypotheses regarding pre and post fire responses of forests and organisms of interest including spotted owls. The studies that have been undertaken are constrained by small sample sizes and must often use comparative assumptions to look at post-fire habitat use. Few case studies have been able to compare pre- and post-fire habitat use and these studies are not directly comparable to each other. Large differences in landscapes and high degrees of variability exist between studies; spatial arrangement of suitable habitat, locations of activity centers, burn severities and scales, pre-fire forest management, post-fire forest management, and myriad other factors combine to reduce the certainty or applicability of site-specific results of observational studies to projects being proposed.

For purposes of this analysis we rely on general patterns observed and reported in the literature to base our understanding of spotted owl use of burned landscapes, and to assess the likely effects of post-fire management activities, such as salvage, fuels reductions, or hazard tree mitigation on spotted owls.

One characteristic shared by most, if not all of the studies published on spotted owl use of burned areas is they suffer from low sample size issues. Due to this, results from research into the effects of wildfire on all three subspecies of spotted owls are often combined in order to achieve sufficient sample size and statistical power to detect differences between paired analyses (pre- and post-fire, unburned versus burned) (Bond et al. 2002, Lee et al. 2012). To increase statistical power the factors evaluated have also been lumped into increasingly broader categories (i.e.

burned vs. unburned, occupied vs. unoccupied, logged versus unlogged). While this may increase statistical power in data analysis, our ability to evaluate project-level effects at fine scales is somewhat limited by the small number of studies, which all suffer from low sample sizes. However, the Service must consider and weigh best available information in evaluating effects to the species.

Population level effects

Responses such as shifts in home ranges or disproportional use of variably burned areas in some cases can be difficult to predict and the uncertainty is compounded by the wide array of post-fire treatments that may be applied. While Bond et al. (2002) and Lee et al. (2012) suggest similar occupancy, survival, and extinction rates between burned and unburned territories, or pre- and post-fire use of known territories, the detail in how and why spotted owls used the post-fire landscapes was not discernible in those studies. For instance, Lee et al. (2012) only required one nighttime observation 1 to 3 years post-fire within the general area of a Primary Activity Center (PAC) to classify an Activity Center as "occupied." While this study suggests some site fidelity and habitat suitability 1-3 years post-fire, the methodology cannot determine if spotted owls shifted their use to unburned areas within the PAC, nor was it long enough in duration to determine if spotted owls would avoid burned areas in subsequent years. Important questions regarding persistence, reproductive success or fitness of spotted owls occupying burned habitats remain somewhat unanswered (but see references to Clark below).

Research at more localized scales has had variable results that were again influenced by small sample sizes and a wide variety of forest management practices in pre- and post-fire landscape (Bond et al. 2009, Clark 2007, Clark et al. 2011, Clark et al. 2013, Elliott 1985, Gaines et al. 1995, Jenness et al. 2004, King et al. 1998, Roberts et al. 2011). In southwest Oregon, lower spotted owl occupancy and survival rates of were observed in burned areas compared to unburned, but the results were confounded by prior management and post-fire harvest (Clark 2007, Clark et al. 2011, Clark et al. 2013). Jenness et al. (2004) found decreased occupancy by Mexican spotted owls in burned areas compared to unburned areas; however the authors considered the results statistically weak. Roberts et al. (2011) similarly found no significant difference in occupancy of California spotted owls between burned and unburned areas in Yosemite National Park; however their models suggested slightly lower occupancy and density in burned areas. Additionally, while Roberts et al. (2011) presented that spotted owls may occupy areas that burned at generally low-to-moderate severity 2-14 years prior; the study design did not allow them to determine whether any shifts in use occurred over time. The results produced by Roberts et al. (2011) were also confounded by low sample sizes and the inability to separate the effects of different fire types that influenced the fire size and intensity (prescribed fire, wilderness fire for resource benefit, and uncontrolled wildfire).

None the less, in general, these studies in combination suggest a negative influence of high severity wildfire on spotted owl occupancy and survival, results that may be compounded by prior forest management or post-fire management activities (Clark et al. 2011, Clark et al. 2013, Jenness et al. 2004, and Roberts et al. 2011).

Effects to pairs and individuals

Our assumptions about likely effects of fire and post-fire forest management on spotted owls are based on conditions and scenarios described in literature compared to the site-specific conditions for projects being evaluated. Studies have detected highly variable responses to fire-caused habitat changes with apparent habitat value declining with burn severity (Bond et al. 2009, Clark 2007, Clark et al. 2011, Clark et al. 2013, Gaines et al. 1995, King et al. 1998). Research that is conducted pre- and post-fire appears to offer more insight into the immediate effects of wildfire to individuals compared to research conducted post-fire only. Additionally, temporal aspects of several studies also influenced observations. As the time since the wildfire increases and vegetation recovers, prey abundance likely increases, woodrats in particular, and thereby potentially influences observed habitat selection. Thus, our assumptions about likely effects of fire and post-fire forest management on spotted owls are based on conditions and scenarios described in literature compared to the site-specific conditions for projects being evaluated.

Radio-telemetry based studies provide greater detail than occupancy-based studies when describing spotted owl use of burned landscapes and habitat selection. Based on a large number of observations radio-telemetry studies can accurately evaluate habitat types that individuals are selecting or avoiding and quantify the post-fire habitat use in core use areas and home ranges of northern spotted owls. Occupancy-based studies essentially base their conclusions on whether a given area is occupied before and after the fire. These studies only require one observation to determine occupancy and therefore have limited ability to evaluate habitat selection or small scale movements. Our understanding of post-fire habitat selection is essential to our evaluation of proposed projects in burned areas and results from telemetry studies likely provide the strongest basis for predicting potential effects to northern spotted owls and their habitat.

Activity Center Occupancy

Because the habitat conditions evaluated in the literature were highly variable, not adequately described, and not directly comparable to one another, these studies *cannot be used to determine a single threshold value for determining post-fire occupancy.* Therefore the determination of occupancy by northern spotted owls in a post-fire landscape is based on professional judgment and the interpretation of the best available data, including pre- and post-fire habitat conditions, literature on spotted owl habitat use and occupancy following both fire and post fire forest management practices, and other site-specific information. In addition to pre and post fire habitat conditions, abiotic factors such as distance to streams, slope position, elevation, and aspect also influence site selection (Forsman et al. 1984, Irwin et al. 2007, USDI 2009). Site fidelity, or continued use of an area over time, is considered in determining spotted owl use of burned areas that were previously suitable (Bond et al. 2009, Clark 2007, Lee et al. 2012).

Several radio-telemetry studies detected a positive correlation between higher amounts of suitable habitat remaining post-fire and the probability of post-fire site occupancy by northern spotted owls (Bond et al. 2009, Clark 2007, Gaines et al. 1995). Areas that were not habitat pre-fire, such as brush fields or meadows, were not used to a greater extent post-fire and are not expected to contribute towards territory occupancy (Clark 2007). Therefore, just as in landscapes having escaped recent fire, the amount and condition of nesting and roosting habitat following fires is likely the most powerful predictor of the probability of spotted owl occupancy and potential reproduction (Clark et al. 2013 and Comfort 2013).

Nesting and Roosting
Sites selected by northern spotted owls for nesting and roosting in post-fire landscapes generally experience either no fire or low- to moderate- severity fire (Bond et al. 2009, Clark 2007, Clark et al. 2011, Clark et al. 2013, King et al. 1998). Additionally, where vegetation was measured, sites selected consistently had high canopy closure (Bond et al. 2009). High-severity burns were generally not used by spotted owls for nesting or roosting (Bond et al. 2009, Clark 2007, Clark et al. 2011, Clark et al. 2013, King et al. 1998) presumably because the live canopy is essentially consumed in the fire. This would suggest that low- to moderate-severity fires that retain adequate canopy can function for nesting or roosting and thus allow the continued use of spotted owl activity centers, while territories that burned at high-severity no longer supported nesting spotted owls. It is expected that within mixed severity burns, spotted owls will select the best available post-fire suitable habitat and Activity Centers at these locations may persist into the future.

The effects of wildfire on spotted owl Activity Center occupancy is categorized two ways, either as shifts or as losses.

Shifts
Where activity centers were affected by fire (any range of severities) but sufficient habitat remains in the home range and immediately adjacent area, site fidelity may cause spotted owls to increase the size of their home ranges or shifted locations to encompass the best available habitats rather than vacate the burned site (King et al. 1998, Clark 2007, Clark et al. 2011, 2013). Thus, a ***shift*** is defined as the condition where the area is presumably still functional and considered occupied, but the core use area may move to the best available habitat immediately adjacent to the prior activity center or to another location in suitable habitat within the immediate area, presumably within the pre-fire home range.

Losses
When high-severity fire affects a significant portion of the suitable habitat in the core and home range, available literature suggests that Activity Centers are no longer functional and the spotted owls were either killed during the fire, move significantly, or perish soon after the fire (Clark 2007, Gaines et al. 1995, King et al. 1998). In some instances spotted owls were observed temporarily returning to these territories, though the territory no longer functioned to support spotted owl occupancy into the future (Clark 2007). Essentially site fidelity was over ridden by the lack of suitable habitat remaining within the historic use area. Thus a ***loss*** is defined as the condition where the activity center is presumably no longer functional due to habitat alteration from high-severity fire, and there is insufficient habitat immediately nearby to allow the birds to shift. Such an activity center would be considered unoccupied for this analysis and may not be functional to support spotted owls for several decades. It is important to recognize that post-fire management in burned but functional habitat may exacerbate the reduced habitat value following fire and result in losses where shifts might have otherwise occurred.

Post-Fire Habitat Use
Once a spotted owl Activity Center and territory is presumed to be occupied, we must predict how spotted owls use the post-fire landscape in order to determine the effects to spotted owls from a proposed project. The use of burned landscapes by spotted owls may depend both on severity and the distance from the activity center (Bond et al. 2009, Clark 2007, Clark et al. 2011, and Clark et al. 2013). Because spotted owls exhibit site fidelity and are central-place

foragers (Rosenberg and McKelvey 1999), spotted owls may continue to use the post-fire landscape depending on the remaining post-fire habitat conditions (sufficient habitat) in the area (Clark 2007, Clark et al. 2011, Clark et al. 2013, Gaines et al. 1995, King et al. 1998). Site selection for nesting and roosting, described above, would therefore also influence the areas used for foraging. The reverse is also true, as nest site selection may be influenced by the proximity to sufficient foraging habitat.

Foraging

It is important to note that while high-severity burn areas do not meet standard definitions of foraging habitat, and are therefore characterized as non-habitat for purposes of tracking the classic green environmental baseline, spotted owl use of these burned areas is well documented (Bond et al 2002, Bond et al. 2009, Clark 2007, Clark et al. 2011, Clark et al. 2013, Gaines et al. 1995, Jenness et al. 2004, King et al. 1998, Lee et al. 2012, Roberts et al. 2011). Areas that were not habitat pre-fire were not used to a greater extent post-fire, so this discussion focuses on areas that were suitable habitat before the fire but may not meet standard spotted owl foraging habitat definitions post-fire (Clark 2007).

Clark (2007) found that northern spotted owls used the best available habitat, which largely consisted of areas of nesting/roosting or foraging habitats that were unburned or were burned at low-to-moderate-severity. He noted that spotted owls occasionally traveled large distances to forage in unburned areas. While severely burned areas were used, observations indicated that spotted owls selected the edges near less severely burned areas. Clark (2007) also described that within salvaged areas, 60 percent of locations were associated with 'leave islands', riparian reserves, and stands of thinned trees. However, he was unable to evaluate the difference in effect between high severity burn areas with or without subsequent salvage. Utilizing Clark's data, Comfort (2014) found that spotted owls generally used habitat characterized by higher suitability, lower disturbance severity, lower amounts of hard edge and higher amounts of diffused edge, but these results varied by scale of measurement. Spotted owls avoided large, contiguous patch of high-severity disturbance but also found that spotted owls can benefit from small patches of high severity fire that are surrounded by moderate to low-severity fire (Comfort 2014). Diffuse edges are likely to be good habitat for woodrats (Clark 2007), which are more likely to occur at high densities in early seral (brushy/sapling to pole-sized trees) and old-growth forests (Sakai and Noon 1993).

Similarly, King et al. (1998) described observational studies where spotted owl use shifted away from burned areas, although only 20 percent of the locations were nighttime foraging. Four years post-fire, Bond et al. (2009) found that California spotted owls were foraging in all burn severities, with a stronger selection for the edges of high-severity burns, presumably taking advantage of an increase in prey (particularly woodrats) during a period of abundant regrowth of shrub and herbaceous vegetation.

Based on the evidence that these studies provide, we make the following assumptions regarding spotted owl use of post-fire landscapes: 1) Spotted owls select for unburned or low-severity burned suitable habitat for nesting and roosting, 2) that as distance from cover increases, spotted owl foraging use declines such that limited use of the interior of high-severity burns is expected. The maximum distance from cover that spotted owls will forage remains unknown; however, spotted owls seem to select for the edges of high-severity burns rather than the interior; and 3)

spotted owls use multiple fundamentally different fire created edges at different spatial scales (see Comfort 2014).

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[1] - This Appendix is based on previous work as summarized by the Yreka Fish & Wildlife Office of the U.S. Fish and Wildlife Service.

APPENDIX 2. DETAILED PROJECT DESCRIPTIONS FOR THE BRIMSTONE-STRATTON FIRE SALVAGE, ASSOCIATED HAZARD TREE REMOVAL AND PUMP CHANCE MAINTENANCE PROJECTS (COPIED FROM THE ASSESSMENT (USDI BLM 2014).

BRIMSTONE/ STRATTON CREEK FIRE SALVAGE

Project description:

Treatments would focus on matrix commercial forest land within the fire perimeter and would follow the Medford RMP Management Direction for Salvage in Matrix. Only mortality above the level needed to meet snag retention and other habitat goals and provide desired levels of coarse woody debris would be harvested (USDI BLM 1995, 186).

The proposed action aims to harvest dead and dying trees due to wildfire and initiate a stand with species suited to the natural plant community including drought resistant tree species. Retained legacy structures would occur as dispersed and/or aggregated residuals. A legacy of the previous stand of suitable live green trees, standing dead, and coarse woody debris would remain to meet the needs of species and provide for ecological functions. Subsequent tree planting would accelerate early seral development and restore a multi-layered conifer forest at the landscape

Only trees considered dead, dying, or high risk (tree health condition indicates that the tree death will probably occur within 4 years) would be harvested. However, to access some of these dead and dying trees, some incidental live trees may be felled and removed through yarding corridors, landings, and road construction. Crown scorch is a measure of the proportion of foliage that has been killed by the fire relative to the entire amount of foliage present before the burn (SWOFIDSC 2001). Shaw et al. (2009) identify trees with more than 50 percent crown scorch as having high risk of insect attack that should be removed to avoid subsequent post-fire insect related damage. Using crown scorch of ≥70 percent, excluding cambium inspections, is a conservative measure for determining post-fire mortality in trees, primarily Douglas-fir, with a high probability of dying within the next 2-5 years (SWOFIDSC 2001, Fowler and Seig 2004, Filip et al. 2007).

Overstory fire-killed trees (as defined above) would be retained at a minimum of 2 snags per acre 20″ DBH or greater within salvage units in the matrix In addition, all existing down coarse wood would be left and protected to the greatest extent possible during treatment per the 1995 ROD/RMP management direction (p. 39). When stands are deficient in coarse woody debris (a minimum of 120 feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long), merchantable material would be used to make up the deficit (USDI 1995). Retention of 4-7 snags per acre 20″ DBH or greater would occur in salvage units within ½ mile northern spotted owl core circles (and in the Stratton Creek fire on CHU designated land) to provide additional wildlife structure. As mentioned above in the Implementation Tools Section, some green trees may be removed for landing and temporary route construction, tail-hold trees, and yarding corridors. However, the green tree removal will be minimized through project design criteria and sale administrator approval.

Brimstone Fire

- Within marked unit boundaries, harvest fire-killed and fire-injured trees 8" DBH and greater that exhibit ≥70 percent crown scorch (DF, PP, SP, and IC).
- Within marked unit boundaries with stands burned at a mixed severity, only individual dead or dying trees or small pockets of dead or dying trees would be removed.
- To create access for planting sites and site preparation, pockets of **dead** sub-merchantable material less than 8" DBH may be slashed, piled and burned, or removed to be utilized for firewood, biomass, piled and burned, chipped, or any combination thereof.
- Hardwoods with live branches should be retained on-site.
- Where available, retain a minimum of 2-7 dead/dying trees (snags) per acre over 20" DBH within unit boundaries outside of NSO core areas.
- Where available, retain an average of 4-7 dead/dying trees (snags) per acre over 20" DBH within units occurring in NSO core areas.
- Even spacing of the retention trees is not required and the leave trees/snags can generally be clustered in groups of 3 or more. These trees are meant to act as wildlife trees/snags and future downed woody material on the harvested areas. The untreated clusters will be placed in a location within the unit to avoid felling the trees to meet OSHA requirements.
- If conditions exist, units within the 0.5 mile NSO core area will retain an average of 4-6 dead/dying trees per acre over 20" DBH within unit boundaries. Some units within the 0.5 mile core area were previous young plantations prior to the fire, with very few 20" DBH trees.
- Live trees would be retained; however, some live trees would need to be felled and extracted for landing construction, temp road construction, and road widening for suitable haul widths. Yarding corridors will avoid going through patches of live trees in order to minimize the effects to unburned forest stands.

Stratton Creek Fire

- Within marked unit boundaries, harvest fire-killed and fire-injured trees 10" DBH and greater that exhibit ≥70% crown scorch (DF, PP, SP, and IC).
- Within marked unit boundaries with stands burned at a mixed severity, only individual dead or dying trees or small pockets of dead or dying trees would be removed.
- To create access for planting sites and site preparation, pockets of **dead** submerchantable material less than 8" DBH may be slashed, piled and burned, or removed to be utilized for firewood, biomass, piled and burned, chipped, or any combination thereof.
- Hardwoods with live branches should be retained on-site.
- Retain 4-7 dead/dying trees per acre over 20" DBH, ≥50 ft ht, Decay Class 1 & 2 within unit boundaries. Even spacing of these trees is not required and the leave trees/snags can generally be clustered in groups of 3 or more. These trees are meant to act as wildlife trees/snags and future downed woody material on the harvested areas. The untreated clusters will be placed in a location within the unit to avoid felling the trees to meet OSHA requirements.
- Live trees would be retained; however, some live trees would need to be felled and extracted for landing construction, temp road construction, and road widening for suitable

haul widths. Yarding corridors will avoid going through patches of live trees in order to minimize the effects to unburned forest stands.

Conservation measures specific to the Brimstone/Stratton Creek Fire Salvage

- Higher retention of large snags, and CWD would occur in the unit within critical habitat (Stratton Creek Fire) and within the NSO core areas of the Brimstone Fire. Snag retention would be 1-5 snags/acre higher than the 1995 RMP standards for matrix. In the matrix LUA, all existing down coarse wood would be left and protected to the greatest extent possible during treatment per the 1995 ROD/RMP management direction (p. 39). When stands are deficient in coarse woody debris (a minimum of 120 feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long), merchantable material would be used to make up the deficit (USDI BLM 1995)

Imminent Hazard Tree Removal (*Brimstone/Stratton Creek Fires)*

Project description:

The immediate roadside hazard tree removal project will occur on Medford BLM administered lands, along roads managed by the BLM within the 2013 Brimstone and Stratton Creek Fires. Hazard trees are present in all burn severities within the fire perimeters.

Danger trees that pose an immediate hazard to the public and BLM workers will be identified and removed within the first year after the fire. Only trees identified as hazardous by the Field Guide for Danger Tree Identification and Response (Toupin et al. 2008) will be felled. Identified trees will also follow the Occupational Safety and Health Administration (OSHA) "Danger Tree" rule (29 C.F.R. § 1910.266 (h)(1)(vi)):

> *Each danger tree shall be felled, removed or avoided. Each danger tree, including lodged trees and snags, shall be felled or removed using mechanical or other techniques that minimize employee exposure before work is commenced in the area of the danger tree. If the danger tree is not felled or removed, it shall be marked and no work shall be conducted within two tree lengths of the danger tree unless the employer demonstrates that a shorter distance will not create a hazard for an employee. A danger tree includes any standing tree that presents a hazard to employees due to conditions such as, but not limited to, deterioration or damage to the tree, and direction or lean of the tree.*

Danger trees have been identified along BLM managed roads within the fire perimeter. Some trees are clumped, while others are scattered along the road. As mentioned above, there are 17 miles of roads across all ownerships within the fire perimeters and approximately 42 trees have been identified in the field as imminent hazard trees on BLM lands. These trees range in size from 12" DBH to 48" DBH and the average size is approximately 18" DBH. For this assessment, the BLM will assume up to 18 additional imminent hazard trees could be identified within the Brimstone/Stratton Creek Fires, for a total of 60 trees that would need to be felled for safety reasons. These additional trees may need to be removed to ensure safe hauling conditions for the Brimstone/Stratton Creek fire salvage project. The felling of 60 trees would total approximately eight acres of affected NSO habitat (0.125 acres per tree). Additional trees identified that exceed the 60 imminent hazard trees covered in this assessment, will be covered under emergency consultation or reinititation of this biological assessment,

Once felled, hazard trees could be available for sale. Identified hazard trees located outside of the road prism (area extending from 10 feet beyond the cut-slope to 5 feet beyond the fill slope), may be left in the stand after the trees are felled when stands are deficient in coarse woody debris.

Conservation measures specific to Roadside Fire Hazard Tree Removal

- Hazard trees that need to be felled outside of the road prisms within Known Spotted Owl Activity Centers (KSOACs), nest patches, critical habitat, and RA32 stands will be left in the stand after the trees are cut in order to provide additional CWD if assessments determine these areas are deficient in CWD.

PUMP CHANCE CLEARING

***Project description*:**

This project is designed to improve and maintain access to five water sources used in emergency wildland firefighting situations. The project includes limited amounts of brush, small diameter (≤ 8" DBH) conifer, and hardwood (≤ 14 DBH) removal immediately adjacent to each water source to allow for clear and unobstructed ingress and egress at these sites. All projects combined would amount to no more than 2 acres of vegetation treatments, but only ¼ of an acre would be cleared at any one site. In general the sites are already disturbed and the majority of the vegetation removal would occur along the edge of the roadway and the areas immediately adjacent to the ponds. This is a Title 2 project[1] that also provides funding to clear vegetation around one private pump chance. The pump chance on private land is also included in this Biological assessment because federal funds are used to complete the work on private lands. Individual project descriptions are given below for each of the five sites:

- ***Bonnie Rifle Spring and Spring Box***: 1/10-acre of brushing and small saplings removed (less than 8" DBH). Species to be removed mostly hardwoods and maybe a couple of Douglas firs saplings.
- ***Bonnie Riffle Pump Chance***: Remove brush species and small saplings within a previously disturbed area; mostly hardwoods less than 2" DBH.
- ***Bonnie Riffle Helipond Site***: Re-construction of this site would include removal of brush species and small saplings (less than 8" DBH).
- ***Bonnie Creek Pump Chance***: Less than ¼-acre of brush and small saplings removal within previously disturbed areas and within the road prism.
- ***Skull Creek Pump Chance (Private-Plum Creek)***: Improve ramp access, remove brush species and small saplings on approximately ¼ acre of a previously disturbed area.

1 Title II projects are part of the Secure Rural Schools and Community Self- Determination Act of 2000. Title II of the Act makes funds available for a variety of activities that benefit federally managed lands and resources such as trail maintenance, road maintenance, watershed restoration, control of noxious weeds, and fire protection.

Bear Creek Riparian Improvement Project

Project Story

The 400-square-mile Bear Creek basin, located entirely within Jackson County, Oregon is the most urbanized watershed in Southern Oregon. The mainstem flows through five communities, the largest being Medford, before it joins the Rogue River at River Mile 127. The creek is water quality limited for phosphorus, dissolved oxygen, temperature and fecal coliform (DEQ Fact Sheet 2012).

This reach of Bear Creek is used for spawning, rearing, and migration for adult Chinook and Coho salmon as well as steelhead (ODFW 2013). Coho salmon are currently listed as threatened under the Endangered Species Act. The project area is bordered by Interstate 5 on the east and private property (mostly businesses) on the west. The Bear Creek Greenway running through the eastern side of the project provides access for walkers, hikers and bikers allowing residents a unique opportunity to see the importance of healthy streams and riparian areas, to observe salmon in Bear Creek, and see the how restoration is being done in the watershed.

A partnership, led by the Rogue Valley Council of Governments (RVCOG) and including the City of Medford (City), Oregon Stewardship and the Jackson County Job Council, is working with public and private landowners in downtown Medford to improve riparian and stream bank conditions along a mile of the stream from 10th Street downstream to McAndrews Road. The project has extensive community support from entities including Coyote Trails, Rogue Community College (RCC), Red Cross, Bear Creek Watershed Council, Medford Art Gallery, Gordon Elwood Foundation, the Bear Creek Greenway Foundation and Jackson County. The project area is adjacent to a Freshwater Trust project and ties into work that is (or has) being done upstream and downstream on Bear Creek by the City, RVCOG, Oregon Stewardship, and others.

The project includes: removal of invasive plants including Armenian Blackberry and poison hemlock; the planting and maintenance of native trees and shrubs, and the incorporation of bioswales to treat urban runoff flowing through riparian areas. Actions will improve stream conditions; most notably sediment storage, nutrient delivery and routing as well as improved water quality conditions through shading and filtering provided by riparian plant growth and development. These conditions will aid in addressing water quality concerns and provide better conditions for adult and juvenile salmon and steelhead.

We are requesting funds for the first 18 months of the project. Activities scheduled beyond September 2015 will be funded through other sources.

Project Description

We will remove invasive plant species while retaining native plants during the late summer and early fall of 2014. We will install irrigation and plant native trees and shrubs. We will then maintain (water, weed, and replant) the planting area for three years (2015 through 2017). We will use the city of Medford Riparian Planting Guide (http://www.ci.medford.or.us/files/riparian%20planting%20guide.pdf) and the Hawthorne Park Plan (http://www.ci.medford.or.us/Files/Envision%20Hawthorne%20Park.pdf) as guidance documents. We will also monitor the area for five years (2015-2019). Project tasks after September 2015 will be funded by matching funds.

Project Justification

The project builds upon work that has been ongoing in the watershed over the last decade. Restoration of Bear Creek including the project area was identified as a high priority in the Bear Creek Masterplan, the Hawthorne Park Plan, the Bear Creek Watershed Assessment, and local TMDL plans. In addition, "The 2013 City of Medford Bear Creek Corridor Restoration and Enhancement – 10th Street to McAndrews" report outlines how to implement the proposed project.

The project will improve sediment storage, water quality and native fish habitat by filtering pollutants and shading the stream. The project will also provide improved access for recreation and aesthetics for the residents of Jackson County from the Bear Creek Greenway, a proposed creek overlook provides an opportunity for interpretive signage near a salmon spawning area, and the future planning of additional hiking trails through portions of the project area.

Project Goals and Objectives

Project Goal: To restore habitat along approximately one mile of Bear Creek by managing invasive species and enhancing the riparian corridor through the planting and maintaining of local native species. Secondary goals are to build upon the momentum of the Bear Creek Urban Working Group, the work underway or completed by the City of Medford and Oregon Stewardship, and to educate and connect community residents with restoration throughout the Bear Creek watershed.

Specific Project Objectives:

1. Remove up to 4 acres of invasive plant species.
2. Plant approximately 2,500 native trees and shrubs along Bear Creek in Medford
3. Install irrigation systems for the project.
4. Monitor and maintain the sites for five years.
5. Hold a public event regarding the restoration work along Bear Creek.
6. Install signage at proposed creek overlook.

Project Timeline

1. Spring 2014- Develop project schedule for 2014 and 2015.
2. Spring 2014- Develop contracts, agreements, obtain any needed permits and permissions to begin work in the fall of 2014.
3. Spring/Fall 2014 host a kick-off event at Hawthorne Park with Oregon Stewardship and other project participants.
4. Early Fall 2014. Spray areas of blackberry and other invasives by certified applicator. Remove blackberry patches by hand or machine. Leave blackberry litter as mulch. Install Irrigation system.
5. Late fall/ early Winter 2014-Install native plants
6. Before March 15, 2015. Spot spray by certified applicator if needed depending on response from initial spray and removal efforts. Conduct before March 15 to minimize disturbance to migratory birds. Monitoring will be used to gauge effectiveness and length of this task.
7. Late spring/summer 2015-Plant maintenance. Three visits.
8. 2015-2019-Monitor areas. Annual visits

Planting Plan

We will have a minimum plant density of 600 stems per acre. Proposed planting is based on the 2013 City of Medford Bear Creek Corridor Restoration and Enhancement – 10th Street to McAndrews report. The planting will use strategies using three planting zones (Figure1, Table 1):

1. Zone A focuses on plants that can tolerate flooding and like a wetter footprint,
2. Zone B plants are mixed and in some cases need tolerate extreme conditions due to the slopes and nature of the understory, and
3. Zone C plants that provide more shade and can tolerate sun and drier conditions.

We will use larger containers (one gallon or larger) for trees and shrubs to attain the desired planting goals more rapidly. Larger containerized plant stock are more tolerant of existing local climate conditions because they are less vulnerable to transplant shock and are more capable of moisture retention during the

transplanting process (National Tree Trust, 1997). Additional plant stock can be harvested onsite using cuttings. Cuttings can be used with appropriate species including willows, dogwood and cottonwoods.

Figure 1.

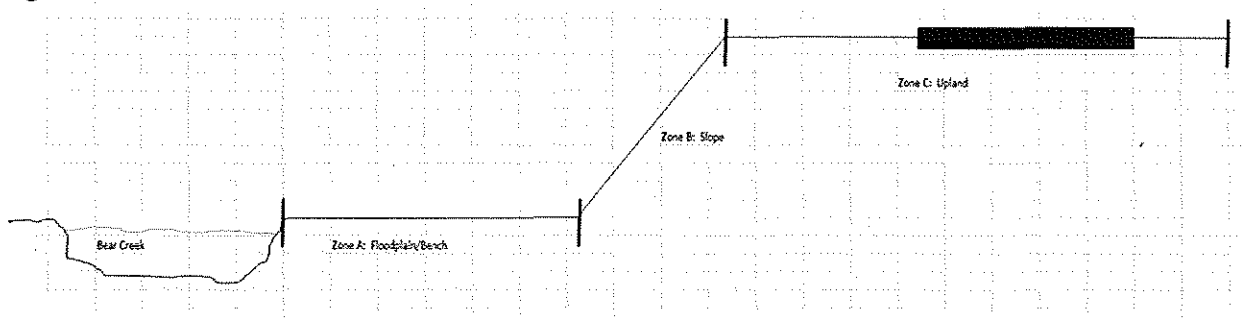

Table 1.

Zone A Plants

Willows (toe of slope)	White Alder	Snowberry	Pacific dogwood
Western Dogwood	Pacific Ninebark	Rush species (Juncus)	Douglas Spirea
Blue Elderberry	Sedge species		

Zone B Plants

Dogwood	Snowberry	Rose (nootka, woodsii)	Douglas Hawthorne
Oregon Ash	Ocean Spray	Big Leaf Maple	Douglas Spirea
Willows (toe of slope)			

Zone C Plants

Oregon Ash	Big Leaf Maple	Incense Cedar	Ponderosa Pine
White Oak	Oregon Grape	Snowberry	Mock Orange
Oceanspray			

Plant Maintenance

Maintenance will include hand or mechanical removal, chemical application by a certified applicator, mulching, and; if necessary, replanting. All plantings will be mulched twice each year from 2015 through 2017. Visits to maintain plants (such as weeding, replanting if necessary) will be accomplished during the late spring/summer of 2015 through 2017.

Monitoring Plan

Monitoring will provide a picture of project progress for five years (2015 -2019). The plan is flexible to adapt to changing needs as the plantings mature over time. In addition, we will use existing monitoring that is occurring or has occurred along Bear Creek. A data survey will be conducted as part of the monitoring effort to identify existing data and potential reference sites for comparison if needed (http://www.oregon.gov/OWEB/docs/pubs/monitoringstrategy.pdf).

Monitoring parameters will include: Video of the project pre and post planting/invasive species control, photo points for the site, annual surveys of plant survival using representative plots based on clustered random sampling, canopy cover (optional), shade (solar pathfinder), stream temperature, and macroinvertebrates.

Project Budget

The entire project is estimated at $**74,667.76** . We are requesting a total of $33,000 from the Blue Sky Habitat Program for the following tasks:

Budget Task and Description	*Responsible Entity, Entities, or Contractor*	*Blue Sky Request*	*Match (Source Detail below)*	*Total*
Coordination and Project Management:	RVCOG, City of Medford	$5,000.00	$6,500.00	$11,500.00
Installation – clearing, grading, planting, irrigation, invasive species management:	Oregon Stewardship, Medford, the Job Council, RCC, RVCOG and subcontractor(s), landowners	$15,627.24	19,486.38	$35,113.62
Supplies – trees, shrubs, tools, irrigation supplies	RVCOG, Oregon Stewardship, Medford, Job Council	$4,000.00	$3,000.00	$7,000.00
Public Outreach – signs, public event, advertising, press	RVCOG, Medford, Jackson County, BCWC, Coyote Trails, Bear Creek Urban Working Group	$400.00	$1,375.00	$1,775.00
Monitoring	RVCOG, Oregon Stewardship, RCC	$2,500.00	$3,720.00	$6,220.00
Maintenance – weeding, replanting, mulching	Oregon Stewardship, Job Council, Medford, RCC, RVCOG,	$2,972.76	$4,486.38	$7,459.14
Administration	RVCOG, Medford	$2,500.00	$3,100.00	$5,600.00
	Totals	***$33,000.00***	***$41,667.76***	***$74,667.76***

Match Detail

Name	*In-kind*	*Cash*	*Total*	*Pending or Secured*
City of Medford	$15,000.00	$15,000.00	$30,000.00	S
Oregon Stewardship	$5,000.00	0	$5,000.00	S
Job Council	$2,972.76	0	$2,972.76	S
RCC	$1,000.00	0	$1,000.00	P
Bear Creek Watershed Council	$375.00	0	$375.00	S
Private Landowners	$1,000.00	0	$1,000.00	P
RVCOG	$1,320.00	0	$1,320.00	S
Total	***$26,667.76***	***$15,000.00***	***$41,667.76***	